Data Evaluation Report on the Reproductive Effects of Fluometuron on Northern Bobwhite (*Colinus virginianus*)

PMRA Submission Number: N/A EPA MRID Number 479844-01

Data Requirement:	PMRA Data Code	N/A
	EPA DP Barcode	375360
	OECD Data Point	N/A
	EPA MRID	479844-01
	EPA Guideline	OPPTS 850.2300

Test material: Fluometuron **Purity:** 98.7% (based on Certificate of Analysis)

Common name

Chemical name:
IUPAC: 1,1-dimethyl-3-(α,α,α-trifluoro-m-tolyl)urea.
CAS: N,N-dimethyl-N′-[3-(trifluoromethyl)phenyl]urea
CAS No.: 2164-17-2
Synonyms: Not reported

Primary Reviewer: Joan Gaidos
Staff Scientist, Dynamac Corporation
Signature:
Date: 06/1/10

Secondary Reviewer: Teri S. Myers
Senior Scientist, Cambridge Environmental Inc.
Signature:
Date: 06/16/10

Primary Reviewer: Amy Blankinship
EPA/OPP/EFED/ERB-2
Date: 08/20/10

Secondary Reviewer(s): Jean Holmes
EPA/OPP/EFED/ERB-2
Date: October 14, 2010

Reference/Submission No.: N/A

Company Code	N/A	[For PMRA]
Active Code	N/A	[For PMRA]
Use Site Category	N/A	[For PMRA]
EPA PC Code	035503	

Date Evaluation Completed: October 14, 2010

CITATION: Leuschner, J. 2010. Study on the Reproduction in Birds (Bobwhite Quail) with Fluometuron by Oral Administration via the Diet. Unpublished study performed by LPT-Laboratory of Pharmacology and Toxicology KG, Hamburg, Germany. Study Project No. 14720/01 (Amendment No. 1). Study sponsored by Agan Chemical Manufacturers, Ltd. Ashdod, Israel. Study initiated January 17, 2002 and submitted January 27, 2010.

EXECUTIVE SUMMARY

The one-generation reproductive toxicity of Fluometuron to 16 pairs per level of 27-week old, Northern bobwhite quail (*Colinus virginianus*) was assessed over 26 weeks. For the first 4 weeks of the study, fluometuron was administered to the birds in the diet at nominal concentrations of 0 (control), 15, 50, and 150 mg/kg. According to the study authors, as no effects were observed in the birds treated with the highest concentration (150 mg/kg), the dose levels were increased by a factor of 3 at week 5. For the final 21 weeks of the study, the treatment concentrations levels were increased to 45, 150, and 450 mg/kg diet, respectively. The report does not indicate if the test concentrations were adjusted for purity, but report concentrations only as "ppm"; therefore, the reviewer adjusted the mean measured concentrations based on a percent active ingredient value of 98.7% (from Certificate of Analysis). Mean-measured concentrations at the low and high dose levels for the first set of dietary test concentrations were 14.9 and 148 mg/kg diet (14.7 and 146 mg ai/kg diet) during week 1, respectively. Mean-measured concentrations at the low and high dose levels for the second set of dietary test concentrations were 43.5 and 484 mg/kg diet (43.0 and 477 mg ai/kg diet), respectively. For the purposes of this report, the concentrations of 45, 150, and 450 mg/kg (43.0 (mean measured), 148 (nominal) and 477 (mean measured) mg ai/kg diet, respectively) were used when discussing toxicity value endpoints.

Although not statistically significant, there was a 22% reduction in weight gain for females in the highest treatment group, 450 ppm, compared to the control. In addition, there was an increase in weight gain in males at all fluometuron treatment groups compared to the controls, with a 17, 56 and 184% increase in weight gain compared to the control for the low, middle and high treatment group, respectively, which was also not statistically significant. There was large variability in this endpoint, therefore, detection by statistical analysis of weight gain/loss differences between the treatment groups was difficult. However, given the mean differences observed in the weight gain/loss compared to the control, there is uncertainty in whether fluometuron may actually impact adult weight gain.

The maximum expected field residue level was not reported, therefore it is not known if the concentrations tested are adequate to address potential risk from fluometuron exposure via a chronic dietary pathway. The study authors reported that for an avian acute dietary (5-day exposure) study the LC_{50} was 6481 ppm and that adverse effects were observed at the dietary concentration of 1000 ppm (ruffled feathers in 3 out of 10 birds) (LPT project no. 14749/01).

This study is scientifically sound and but does not satisfy the guideline requirement for a Northern bobwhite quail (*Colinus virginianus*) reproductive toxicity study. This classification is due to this study resulting in a non-definitive adverse endpoint for chronic reproduction for upland birds (e.g., bobwhite quail). Therefore, the concentration at which adverse effects are expected from chronic exposure to fluometuron for upland birds is not known, as the study did not report the maximum expected field residue level. In addition, measured concentrations for all treatment groups were not analyzed at the beginning of the exposure period and again at Week 10; only treated feed from the low and high treatment groups were analyzed, therefore, the actual measured concentration in the middle treatment group is unknown. This middle concentration during the second dosing was the high concentration in the original dose concentrations which was measured and was 98.6% of nominal. The classification of this study is ***supplemental***.

Results Synopsis

Test Organism Size/Age (mean Weight): 27 weeks old; 154 to 246 g (combined sexes)

NOAEC: 477 mg ai/kg diet (mean-measured)
LOAEC: >477 mg ai/kg diet (mean-measured)
Endpoint(s) Affected: None.

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: U.S. EPA Pesticide Assessment Guidelines, §71-4 (1982)
U.S. EPA Ecological Effects Test Guideline OPPTS 850.2300 (1996)
OECD Guideline 206 for Testing of Chemicals (1984)

Deviations from U.S. EPA OPPTS Guideline No. 850.2300 included:

1. During the first 4 weeks of the study, no signs of toxicity were noted, even in the high dose group (150 mg/kg). Therefore, the dose levels were increased by a factor of 3 beginning at Week 5 and the first phase (initial phase) of the study prolonged by 4 weeks.
2. The middle test concentration for the second dose levels (0, 45, 15, 450 mg/kg) initiated at Week 5 did not appear to be analyzed at Week 5 or 10.
3. Cage size was significantly smaller than recommended. OPPTS recommends at least 5,000 cm^2 per bird. In this study, the floor space was only 2500 cm^2 per bird. Also, the offspring pen size and description were not reported.
4. The hatchling body weights were not reported, but day 14 chick weights were obtained as required.
5. The reported body weights for 14-day old survivors in Pens 30 and 32 for the 45 mg ai/kg treatment group appeared to be identical in this amended report. The values for Pen 30 in the original report (MRID 46565703) are different than in this amended report, and the number of values reported in the original report matches the total number of 14-d old survivors where in the amended report it does not.
6. The maximum label rate for Fluometuron was not reported. The dose levels in this study were reportedly selected based on the results of an acute avian dietary study in which the NOAEC was 500 ppm, the LOAEC (nonlethal) was 1000 ppm, and the LC_{50} was 6481 ppm.
7. The initial age of the test birds (27-weeks) was slightly younger than recommended (at least 30 weeks old).
8. The body weights of the adult birds should have been recorded at 14-day intervals until the onset of egg laying. In this study, body weights were only recorded at the beginning of Weeks 1 (study initiation), 15, and 26 (study termination).
9. Only two eggs per hen (nos. 3 and 10) were used for eggshell thickness determinations. Once every 2 weeks all eggs newly laid that day should be removed and measured for eggshell thickness.
10. The percentage of live day 18 embryos was 93.8% based on viable embryos, and the typical percentage is 97-99% of viable embryos.
11. The relative humidity during the pre-laying period was 50-75%. OPPTS recommends relative humidity of about 55%.
12. The pre-laying light intensity was not reported.
13. The photoperiod during hatching was not reported.
14. Test diet preparation and storage conditions were not reported.

All validity criteria were met for the control treatment group, therefore, the initial age of the birds, and cage size for the adults did not have any adverse impact on the study. Although they are not validity criteria, it is recommended that eggs are set weekly and body weights of offspring are measured at both hatch and 14 days post-hatch. 24 eggs per treatment group were collected and analyzed for egg shell thickness, so, although eggs were not collected biweekly, no effects on egg shell thinning was observed; 24 eggs (3^{rd} and 10^{th} egg) should provide the necessary replication to determine effects provided there is not a delayed response for eggshell thickness from exposure to fluometuron. The percentage of live day 18 embryos was slightly lower than typical values, but all validity criteria were met for the control, and this slight decrease did not affect the validity of the study.

However, measured concentrations for all treatment groups were not analyzed at the beginning of the exposure

period and again at Week 10; only treated feed from the low and high treatment groups were analyzed, therefore, the actual measured concentration in the middle treatment group is unknown.

COMPLIANCE: Signed and dated GLP, Quality Assurance and Data Confidentiality statements were provided. This study was conducted in compliance with the USEPA 40 CFR Part 160; USFDA GLP 21 CFR Part 58; EC GLP 'Chernikaliengesetz' (Chemicals Act) in Germany; and in consideration of OECD Principles of GLP, ENV/MC/CHEM (98) 17; and Japan MAFF.

A. MATERIALS:

1. Test Material Fluometuron

Description: White powder

Lot No./Batch No. : D-7167

Purity: 98.7% (based on Certificate of Analysis)

Stability of compound under test conditions: The stability of Fluometuron was verified in treated feed that was stored at ambient temperature for up to 7 days prepared at 15 and 150 ppm (week 1) and again for the 45 and 450 mg ai/kg levels (weeks 5 and 10). For all analyses, results were within 8% of nominal concentrations.

(OECD recommends water solubility, stability in water and light, pKa, Pow, and vapor pressure of test compound)

Storage conditions of test chemicals: Ambient conditions at room temperature.

Physicochemical properties of Fluometuron.

Parameter	Values	Comments
Water solubility at 20°C	Not reported	
Vapor pressure	Not reported	
UV absorption	Not reported	
pKa	Not reported	
Kow	Not reported	

2. Test organism:

Table 1: Test organism.

Parameter	Details	Remarks

		Criteria
Species (common and scientific names):	Northern bobwhite quail (*Colinus virginianus*)	*Recommended species include a wild waterfowl species, preferably the mallard (Anas platyrhynchos) or an upland game species, preferably the northern bobwhite (Colinus virginianus)*
Age at Study Initiation:	27 weeks	Birds were just slightly younger than recommended (≥30 weeks). *Birds approaching their first breeding season should be used.*
Body Weight: (mean and range)	Males: Overall range (n=64) of 166 to 246 g, with group means of 199 to 204 g. Females: Overall range (n=64) of 154 to 229 g, with group means of 192 to 206 g.	Body weights were recorded at Weeks 1 (at study initiation), 15 and 26 (study termination). *Body weights should be recorded at test initiation and at biweekly intervals up to week eight or up to the onset of egg laying and at termination.*
Source:	Geflügelzucht H. & E. Küberich Rüderner Strasse 11 Wiesentheid, Germany	The birds were from the same hatch. *All birds should be from the same source.*

B. STUDY DESIGN:

1. Experimental Conditions

a. Range-finding study: The concentrations selected for use in the definitive study were based upon the results of an acute dietary toxicity study in bobwhite quail (LPT Project No. 14749/01). In this study, the NOAEC was 500 mg/kg diet. First signs of toxicity (ruffled feathers) were noted in 3/10 animals at the 1000 mg/kg diet level. The dietary concentration level of 5000 mg/kg was lethal to bobwhite, and the 14-day acute LC_{50} was 6481 mg/kg diet.

b. Definitive Study

Table 2: Experimental Parameters.

Parameter	**Details**	**Remarks** ***Criteria***

Parameter	Details	Remarks *Criteria*
Acclimation period: Conditions (same as test or not): Feeding: Health (any mortality observed):	2 weeks Same as test Basal diet (Altromin 0179) formulated by Altromin GmbH, 32791 Lage/Lippe, Germany and water (not described) were available *ad libitum* No mortality, debility, or incompatibility occurred during the acclimation period.	The diet was composed of 23.5% crude protein, 3.5% crude fat, 12.5% ash, 13.0% moisture and 42.0% nitrogen-free extract. *Recommended observation period includes a 2-3 week health observation period prior to selection of birds for treatment. Generally, birds should be healthy without excess mortality. Feeding should be ad libitum, and sickness, injuries or mortality should be noted.*
Test duration pre-laying exposure: egg-laying exposure: withdrawal period, if used:	4 wks at initial concentrations 11 wks at adjusted concentrations *Ca.* 10 weeks N/A	As no signs of toxicity were observed during the first 4 weeks of the study, the concentration levels were increased by a factor of 3 and the initial phase was prolonged for 4 weeks. ***Recommended pre-laying exposure duration:*** *At least 10 weeks prior to the onset of egg-laying.* ***Recommended exposure duration with egg-laying:*** *At least 10 weeks.* ***Recommended withdrawal period:*** *If reduced reproduction is evident, a withdrawal period of up to 3 weeks should be added to the test phase.*
Pen (for parental and offspring) size: construction materials:	Parents (one pair) were housed in cages with a surface area of 0.25 m^2 per bird (measurements not reported). Offspring boxes were not described. Parental pens were constructed of galvanized metal (not further described; offspring pens were not described.	Cage size was significantly smaller than recommended. OPPTS recommends at least 5,000 cm^2 per bird. In this study, the floor space was only 2500 cm^2 per bird. Cage sizes smaller than recommended should be shown to not adversely affect the health or reproduction of the quail.

Parameter	Details	Remarks *Criteria*
number:	16 parental pens/treatment level. Hatchlings were group-housed according to the appropriate parental pen of origin.	*Pens* *Pens should have adequate room and be arranged to prevent cross-contamination.* *Materials* *Recommended materials include nontoxic material and nonbinding material, such as galvanized steel.* *Number* *At least 5 replicate pens should be used for mallards housed in groups of 7. For other arrangements, at least 12 pens should be used, but considerably more may be used if birds are kept in pairs. Chicks should be housed according to parental grouping.*
Number of birds per pen (male:female)	2 birds/pen (1 male:1 female)	*One male and one female per pen should be used. For quail, one male and two females should be used. For ducks, two males and five females should be used.*
Number of pens per group/treatment negative control: solvent control: treated:	 16 pens N/A 16 pens/treatment	*At least 12-16 pens should be used, but considerably more if birds are kept in pairs.*

Parameter	Details	Remarks *Criteria*
Test concentrations (mg/kg diet) nominal:	0 (negative control), 15, 50, or 150 mg/kg diet Weeks 1-4 (first dose rate). 0 (negative control), 45, 150, or 450 mg/kg diet beginning Week 5 to Week 25 (second dose rate).	During the first 4 weeks of the study at test concentrations of 0, 15, 40, and 150 mg/kg, no signs of toxicity were noted, even in the high dose group (150 mg/kg). Therefore, the dose levels were increased by a factor of 3 beginning at Week 5 and the first phase (initial phase) of the study prolonged by 4 weeks.
measured:	Test Week 1: 14.92 and 147.6 mg/kg diet; 50 ppm not verified --- Test Week 5: 44.01 and 486.84 mg/kg diet; 150 ppm not verified Test Week 10: 43.02 and 480.56 mg/kg diet; 150 ppm not verified Control <0.10 ppm (<LOD). Overall mean measured: 43.0 and 477 mg ai/kg diet (unclear from study report whether concentrations adjusted for purity (98.7%), therefore reviewer adjusted overall mean measured concentrations)	Measured concentrations were determined at 15 and 150 mg/kg during test Week 1 (first dose rate). All measured values were within ±4% of nominal concentrations. Stability of the 45 and 450 mg/kg levels were determined at Week 5, the initiation of the second dose rates. Concentrations were also measured at Week 10 for 45 and 450 mg/kg test concentrations. All measured values were within ±7% of nominal concentrations. All test concentration verification results were based on one replicate. Periodic analysis of the standard diet by revealed no detectable fluorinated hydrocarbons.
		Recommended test concentrations include at least two concentrations other than the control; three or more will provide a better statistical analysis. The highest test concentrations should show a significant effect or be at or above the actual or expected field residue level.
Maximum labeled field residue		

Parameter	Details	Remarks *Criteria*
anticipated and source of information:	Not specified	*The highest test concentrations should show a significant effect or be at or above the actual or expected field residue level. The source (i.e., maximum label rate in lb ai/A and ppm), label registration no., label date, and site should be cited*]
Solvent/vehicle, if used type: amount:	None. N/A	*Recommended solvents include corn oil or other appropriate vehicle not more than 2% of diet by weight*
Was detailed description and nutrient analysis of the basal diet provided? (Yes/No)	Yes	Offspring were fed the same diet as the parents, without the addition of test substance. *A commercial breeder feed or an equivalent that is appropriate for the test species is recommended.*
Preparation of test diet	A pre-mix was prepared by blending test substance and basal diet with an impact mill (Schlagmühle, Braun KSM 2). This process was repeated until the whole quantity of test compound was distributed in the diet. Then the premix was added to the remaining basal diet, and mixed with a pestle mill (Planetenrührwerk: Herbest + Co. Rapid 8Z) for 15 minutes and then transferred to a closable bucket. No carrier was used to facilitate mixing. The food in the pens was renewed on a weekly basis. Storage conditions were not reported.	*A premixed diet containing the test substance should be mechanically mixed with basal diet. If an evaporative vehicle is used, it should be completely evaporated prior to feeding.*
Indicate whether stability and homogeneity of test material in diet determined (Yes/No)	Yes	
Were concentrations in diet verified by chemical analysis?	Yes	

Parameter	Details	Remarks *Criteria*
Did chemical analysis confirm that diet was stable?	Yes	Stability was assessed in treated feed prepared at 15 and 150 mg/kg during Week 1, and at 45 and 450 mg/kg during Weeks 5 and 10. The diet collection and storage conditions were not detailed. The diets were stored for 7 days. All recoveries were within 8% of nominal concentrations.
and homogeneous?	Yes	Homogeneity was assessed in treated feed prepared at 15 and 150 mg/kg diet. Samples were collected at random from the top, middle, and bottom of each batch. The percent of nominal ranged from 96.27 to 98.25 mg/kg.
Feeding and husbandry	Feeding and husbandry conditions appeared to be adequate, given guideline recommendations.	
<u>Test conditions (pre-laying)</u> temperature: relative humidity: photoperiod:	Average: 22 ± 5°C. Average: 50-75% 7-8 hr light/day during acclimation through Week 12; 16-18 hr light/day thereafter.	Temperature and humidity were for the adult room during the entire study. Deviations were caused during cleaning. Light intensity was not reported. *Recommended temperature: about 21°C (70°F)* *Recommended relative humidity: about 55%* *Recommended lighting* *First 8 weeks: 7 h per day.* *Thereafter: 16-17 h per day.* *At least 6 foot-candles are recommended at bird level.*

Parameter	Details	Remarks *Criteria*
Egg Collection and Incubation		
Egg collection and storage collection interval: storage temperature: storage humidity:	Daily 15-16°C 55-75%	*Eggs should be collected daily; recommended egg storage temperature is approximately 16°C (61°F); recommended humidity is approximately 55-80%. Recommended collection interval: daily*
Were eggs candled for cracks prior to setting for incubation?	Yes	*Eggs should be candled on day 0*
Were eggs set weekly?	No, the eggs were set every other week	
When candling was done for fertility?	Eggs were candled again on Day 11(embryo viability) and 18 (embryo survival).	*Quail: approx. day 11* *Ducks: approx. day 14*
When the eggs were transferred to the hatcher?	Day 21	*Bobwhite: usually day 21* *Mallard: usually day 23*
Hatching conditions temperature: humidity: photoperiod:	37.5°C 70-75% Not reported.	*Recommended temperature is 39°C (102°F)* *Recommended humidity is 70%*
Day the hatched eggs were removed and counted	Days 23 or 24	*Eggs for bobwhite should be removed on day 24; for mallard on day 27*
Were egg shells washed and dried for at least 48 hrs before measuring?	Yes	

Parameter	Details	Remarks *Criteria*
Egg shell thickness no. of eggs used: intervals: mode of measurement:	At least two eggs per pen The 3rd and 10th egg laid from each hen Four points around the girth of the shell using a micrometer graduated to 0.01 mm.	*Newly hatched eggs should be collected at least once every two weeks. Thickness of the shell plus membrane should be measured to the nearest 0.01 mm* with 3 - *4 measurements per shell.*
Reference chemical, if used	None used	

2. Observations:

Table 3: Observations.

Parameter	Details	Remarks
Parameters measured		
Parental (mortality, body weight, mean feed consumption) Egg collection and subsequent development (no. of eggs laid, no. of eggs cracked, shell thickness, no. of eggs set, no. of viable embryos, no. of live 3 week embryos, no. hatched, no. of 14-day survivors, average weight of 14-d old survivors, mortality, gross pathology, others)	- mortality - body weight - food consumption - signs of toxicity - necropsy - eggs laid - eggs cracked - egg shell thickness - eggs set - viable embryos - live 18-day embryos - normal hatchlings - hatchlings of 18-day embryos - 14-day-old survivors - 14-day-old survivor body weight - signs of toxicity of hatchlings	Hatchling body weights were not determined. *Recommended endpoints measured include:* • *Eggs laid/pen* • *Eggs cracked/pen* • *Eggs set/pen* • *Viable embryos/pen* • *Live 3-week embryos/pen* • *Normal hatchlings/pen* • *14-day-old survivors/pen* • *14-day-old survivors/pen* • *Weights of 14-day-old* • *survivors (mean per pen)* • *Egg shell thickness* • *Food consumption (mean per pen)* • *Initial and final body weight (mean per pen)*
Indicate if the test material was regurgitated	No indications of dietary regurgitation.	

Parameter	Details	Remarks
Observation intervals (for various parameters)	Parental and hatchling mortality and signs of toxicity were recorded daily. Parental body weights were recorded on Weeks 1, 15 and 26. Offspring body weights were not reported at hatching, but were reported for 14-day old survivors (not separated by weekly time intervals). Parental food consumption was measured weekly.	*Body weights and food consumption should be measured at least biweekly*
Were raw data included?	Yes	

II. RESULTS AND DISCUSSION:

A. MORTALITY:

No adult mortality or test substance-related changes in behavior or external appearance were observed during the study. Five incidental changes in external appearance were noted consisting of ruffled feathers in 2 males and 2 females in the control group, 1 female in the 45 mg/kg group, 1 male in the 150 mg/kg group, and 1 male in the 450 mg/kg group on test day 33.

There was no treatment-related effect, and the NOAEC for adult mortality was 450 mg/kg diet.

Table 4: Effect of Fluometuron on Mortality of Northern Bobwhite.

Treatment Mean-Measured (and Nominal) Concentrations	Observation Period					
	Week 1		Week 15		Week 26	
	No. Dead		No. Dead		No. Dead	
	Male	Female	Male	Female	Male	Female
Control	0	0	0	0	0	0
14.9/43.0 mg ai/kg diet (15/45 mg/kg)	0	0	0	0	0	0
50 & 150 Not measured; (50/150 mg/kg)	0	0	0	0	0	0
146/477 mg ai/kg diet (150/450 mg/kg)	0	0	0	0	0	0

B. REPRODUCTIVE AND OTHER ENDPOINTS (study author-reported with reviewer comment):

Abnormal Effects/Behavior: No overt signs of toxicity were observed in any treatment group. Incidental clinical observations were related to long-term housing in cages, and included injuries to the head, shoulder, wing, leg, feet, feather loss, ocular injury, lameness, and thinness. The NOAEC for clinical signs of toxicity was 450 mg/kg diet.

Food Consumption: No apparent treatment-related effect on feed consumption was evident between the control group and any of the treatment groups. There was a slight increase in feed consumption in the 150 mg/kg treatment group (first dose set) during Week 2 and in the 150 mg/kg treatment group during Week 14 (second dose set) that were significantly different from the control values at $p < 0.01$. However, these differences were not considered treatment related since they were small and not consistent over time. Mean food consumption for Weeks 1 through 26 was 14 to 15 g/bird/day for all levels (converted by the reviewer from the data reported in g/week/pen). The estimated mean intake of Fluometuron was not calculated. The NOAEC for food consumption was 450 mg/kg diet.

Body Weight: No test substance related effects on body weight were observed at any treatment level, with no statistically-significant differences from the controls observed at any interval. The NOAEC for adult body weight was 450 mg/kg diet. [Reviewer-comment: There was a 22% reduction in weight gain for females in the highest treatment group, 450 ppm, compared to the control. In addition, there was an increase in weight gain in males at all fluometuron treatment groups compared to the controls, with a 17, 56 and 184% increase in weight gain compared to the control for the low, middle and high treatment group, respectively. Due to the variability in this endpoint, these differences were not statistically significant. Therefore, there is uncertainty in whether fluometuron may impact adult weight gain.]

Necropsy: There were no macroscopic findings upon necropsy of surviving birds that were considered related to treatment. Pale discoloration of the liver was noted in 2 males at the 150 mg/kg treatment group, and 4 females in the 450 mg/kg treatment group.

Reproductive Effects: There were no statistically-significant differences observed from the control for any reproductive endpoint at any treatment level. Not every pair of birds during the course of the study successfully reproduced. The number of pairs that did not lay eggs during the study was one in the control and middle treatment group, and two in the lowest treatment group; all pairs successfully reproduced in the highest fluometuron concentration tested. In addition, in the middle treatment group, one pair did successfully lay eggs, but none of the

eggs set were deemed viable when evaluated 14 days later. According to the study author, the ratio of mean viable 18-day embryos/viable 11-day embryos per hen decreased in 450 mg/kg treatment group and the mean percent of hatchlings per viable 18-day embryos increased in the 150 mg/kg treatment group ($p<0.01$) compared to the control, however, these changes were not considered test-item related. The NOAEC for all reproductive endpoints was 450 mg/kg diet.

Table 5: Reproductive and Other Parameters (nominal concentrations; study author-reported).

Parameter	Control	45 mg/kg	150 mg/kg	450 mg/kg	NOAEC/ LOAEC
Eggs laid	665	593	590	630	450 mg/kg >450 mg/kg
Eggs laid/hen	41.6 ± 14.3	37.1 ± 16.1	36.9 ± 15.0	39.4 ± 8.3	450 mg/kg >450 mg/kg
Eggs cracked	3	5	1	5	450 mg/kg >450 mg/kg
Eggs cracked/eggs laid (%)	--	--	--	--	N/A
Egg set	632	560	559	593	450 mg/kg >450 mg/kg
Shell thickness (mm ± SD)	0.2174 ± 0.0145	0.2187 ± 0.0147	0.2200 ± 0.0143	0.2179 ± 0.0135	450 mg/kg >450 mg/kg
Viable 11-day embryos	527	468	453	495	450 mg/kg >450 mg/kg
Viable 11-day embryos/eggs set (%)	82.7 ± 12.7	82.7 ± 12.7	80.1 ± 25.1	83.5 ± 14.2	450 mg/kg >450 mg/kg
Live 18-day embryos	525	465	450	483	450 mg/kg >450 mg/kg
Live 18-day embryos/viable 11-day embryos (ratio)	0.997	0.994	0.928	0.977	450 mg/kg >450 mg/kg
Normal hatchlings	368	354	365	326	450 mg/kg >450 mg/kg
Normal hatchlings/live 18-day embryos (%)	68.5 ± 12.4	74.4 ± 10.2	74.7 ± 24.5	66.0 ± 15.7	450 mg/kg >450 mg/kg
14-day old survivors	287	286	275	251	450 mg/kg >450 mg/kg
14-day old survivors/hen	--	--	--	--	N/A
14-day old survivors/normal hatchings (%)	77.8 ± 17.1	80.0 ± 13.2	73.6 ± 25.4	76.9 ± 11.7	450 mg/kg >450 mg/kg
Hatchling weight (g ± SD)	--	--	--	--	N/A

Parameter	Control	45 mg/kg	150 mg/kg	450 mg/kg	NOAEC/ LOAEC
14-day old survivors weight (g ± SD)	31.26 ± 3.91	31.30 ± 3.36	31.90 ± 3.43	31.29 ± 3.71	450 mg/kg >450 mg/kg
Mean food consumption (g/bird/day)	14.6	14.7	15.4	14.5	450 mg/kg >450 mg/kg
Weight (g) of parent females at test initiation: at Week 15: at test termination:	 204.3 212.5 228.3	 206.3 215.5 233.1	 196.9 207.4 220.3	 191.9 204.9 210.6	450 mg/kg >450 mg/kg
Weight (g) of parent males at test initiation: at Week 15: at test termination:	 199.8 204.1 204.6	 202.6 205.8 208.2	 203.9 209.9 211.4	 199.0 213.9 212.7	450 mg/kg >450 mg/kg
Gross pathology	No treatment-related abnormalities observed.				

N/A – Not statistically analyzed.

C. REPORTED STATISTICS:

The following variables were statistically analyzed: adult body weight, adult feed consumption, percent of hens laying eggs, egg production per hen, percentage of eggs cracked, viable egg production per hen, egg shell thickness, viable embryos as a proportion of eggs set, viable 11-day embryos per eggs set, percent hatching of eggs set, viable 18-day embryos per viable 11-day embryos, hatchlings per viable 18-day embryos, percentage of hatchlings surviving to 14 days, number of 14-day old survivors per hen, body weight of 14-day old survivors.

Sixty four pairs (one male + one female) of adult quail were housed and treated at four treatment levels, each of which contained 16 cages. The arrangement of the cages and treatment design were not reported.

Analysis of variance was applied to determine the differences between groups. The treated groups were compared with the control group using Student's t-test. Sample units were individual pens within each experimental group, except adult body weights, where the sample unit was the individual bird. Nominal concentrations were used for all estimations.

The reported body weights for 14-day old survivors in Pens 30 and 32 for the 45 mg ai/kg treatment group appeared to be identical in this amended report. The values for Pen 30 in the original report (MRID 46565703) are different than in this amended report, and the number of values reported in the original report matches the total number of 14-d old survivors where in the amended report it does not. Therefore, the values for Pen 30 from the report, MRID 46565703, were used in the statistical analysis of 14-day old body weights.

D. VERIFICATION OF STATISTICAL RESULTS:

Statistical Method: Analysis was conducted using "chicks.sas" (Ver. 3; March 2002), a SAS program provided by EFED/OPP/USEPA. Data for all endpoints were examined graphically using box plots to determine if they exhibited a dose-dependent response, which was ultimately used to select the multiple comparison test to detect LOAEC and NOAEC. Data for each endpoint were tested to determine if their distributions were normal and if their variances were homogeneous using Shapiro-Wilk's and Levene's tests, respectively. Data that satisfied

these assumptions were subjected to Dunnett's and William's tests and data that did not satisfy these assumptions were subjected to the non-parametric MannWhitney-U (with a Bonferroni adjustment) and Jonckheere's tests. Data for dead birds were excluded from the analyses. See Appendix I for output of reviewer's statistical verification.

NOAEC: 477 mg ai/kg diet (mean-measured)
LOAEC: >477 mg ai/kg diet (mean-measured)
Endpoint(s) Affected: None.

Table 6: Reproductive and Other Parameters (mean-measured concentrations/nominal; reviewer-reported).

Parameter	Control	14.7/43 mg ai/kg	50/150 mg ai/kg	146/477 mg ai/kg	NOAEC/ LOAEC
Eggs laid/pen	41.6	37.1	36.9	39.4	477 mg ai/kg >477 mg ai/kg
Eggs cracked/pen	0.2	0.3	0.1	0.3	477 mg ai/kg >477 mg ai/kg
Eggs not cracked/eggs laid (%)	99.6	99.1	99.9	99.2	477 mg ai/kg >477 mg ai/kg
Eggs set/pen	39.5	35.0	34.9	37.1	477 mg ai/kg >477 mg ai/kg
Shell thickness	0.22	0.22	0.22	0.22	477 mg ai/kg >477 mg ai/kg
Eggs set/eggs laid (%)	94.8	94.2	94.2	93.9	477 mg ai/kg >477 mg ai/kg
Viable embryos/pen	35.0	30.8	29.6	33.1	477 mg ai/kg >477 mg ai/kg
Viable embryos/eggs set (%)	87.8	87.4	83.4	89.2	477 mg ai/kg >477 mg ai/kg
Live embryos/pen	32.8	29.1	28.1	30.2	477 mg ai/kg >477 mg ai/kg
Live embryos/viable embryos (%)	93.7	94.3	95.3	91.4	477 mg ai/kg >477 mg ai/kg
No. of hatchlings/pen	23.0	22.1	22.8	20.4	477 mg ai/kg >477 mg ai/kg
No. of hatchlings/eggs laid (%)	54.2	58.4	60.4	51.4	477 mg ai/kg >477 mg ai/kg
No. of hatchlings/eggs set (%)	57.1	61.9	64.0	54.7	477 mg ai/kg >477 mg ai/kg
No. of hatchlings/live embryos (%)	68.5	74.5	80.0	66.0	477 mg ai/kg >477 mg ai/kg

Hatchling survival/pen	17.9	17.9	17.2	15.7	477 mg ai/kg >477 mg ai/kg
Hatchling survival/eggs set (%)	44.9	49.8	49.2	42.5	477 mg ai/kg >477 mg ai/kg
Hatchling survival/no. of hatchlings (%)	77.8	80.0	78.9	76.9	477 mg ai/kg >477 mg ai/kg
Hatchling weight (g) [H]	---	---	---	---	--
Survivor weight (g)	31.4	31.2	32.1	31.4	477 mg ai/kg >477 mg ai/kg
Mean food consumption (g/bird/day)	14.6	14.7	15.4	14.6	477 mg ai/kg >477 mg ai/kg
Male weight gain (g)	4.8	5.6	7.5	13.7	477 mg ai/kg >477 mg ai/kg
Female weight gain (g)	24.0	26.9	23.3	18.7	477 mg ai/kg >477 mg ai/kg

[H] Data not reported for this endpoint.

E. STUDY DEFICIENCIES:

Birds in this study were exposed to two different dietary doses. After the first four weeks of no toxic effects at levels up to and including the nominal 150 mg ai/kg level, dose concentrations were increased by a factor of 3 (from weeks 5 to study termination). OCSPP (formerly OPPTS) 850.2300 guidelines do not directly address multiple dosing, but they do require that exposure of adult birds to the test substance should be continuous throughout the test. Additionally, the guidance specifies that concentrations for the test substance should be based on the measured or calculated residues expected in the diet, the range should include an actual or expected field residue exposure level, and the highest nonlethal level may be estimated from the avian dietary LC_{50}. The study author reported that the doses in this study were selected based on an avian dietary study where the LC_{50} was 6481 ppm and the NOAEC was 500 ppm (based on ruffled appearance of some birds at the 1000 ppm level); lethality in this acute dietary study occurred at 5000 ppm.

However, given the second, higher dose exposure in this study failed to detect treatment-related effects, test concentrations may not have been high enough.

F. REVIEWER'S COMMENTS:

The reviewer agreed with the study author's statistical conclusions as there were no statistically significant treatment-related effects detected in this study. Mean-measured concentrations (from the second dosing) were used to express the reviewer's conclusions which are reported in the Executive Summary and Conclusions sections of the DER.

However, there was a 22% reduction in weight gain for females in the highest treatment group, 450 ppm, compared to the control. In addition, there was an increase in weight gain in males at all fluometuron treatment groups compared to the controls, with a 17, 56 and 184% increase in weight gain compared to the control for the low,

middle and high treatment group, respectively. Due to the variability in this endpoint, these differences were not statistically significant. Therefore, there is uncertainty in whether fluometuron may impact adult weight gain.

All validity requirements were met. Specifically, controls produced an average of 17.9, 14-day old survivors per pen during the 10-week production phase (minimum of 12 quail per pen during a 10-week production phase), the egg shell thickness of control eggs was 0.22 mm (minimum of 0.19 mm for quail), and 0% (0/16) adult control mortality was observed during the study (no more than 10% acceptable in controls).

Following remixing on a rolling mill for 20 minutes, *ca.* 1 g portions of treated-diet samples were extracted with 20 mL of acetonitrile in a stoppered 25 mL flask for 10 minutes in an ultrasonic bath, followed by shaking in a water bath for 20 minutes (30°C). Flasks were cooled to room temperature and brought to volume with water. After sedimentation of particles, the supernatant was transferred into a syringe, filtered (0.45 µm) and the filtrate further diluted with HPLC-eluent. The analytical MDL was 0.01 mg/kg diet. Procedural recoveries for fortified diet samples were not reported.

In-life study dates were January 17, 2002 to August 30, 2002.

G. CONCLUSIONS:

This study is scientifically sound but does not satisfy the guideline requirement for a Northern bobwhite quail (*Colinus virginianus*) reproductive toxicity study. There were no statistically significant treatment-related effects in this study. This classification is due to this study resulting in a non-definitive adverse endpoint for chronic reproduction for upland birds (e.g., bobwhite quail). Therefore, the concentration at which adverse effects are expected from chronic exposure to fluometuron for upland birds is not known, as the study authors did not report the maximum expected field residue exposure levels. In addition, measured concentrations for all treatment groups were not analyzed at the beginning of the exposure period and again at Week 10; only treated feed from the low and high treatment groups were analyzed, therefore, the measured concentration in the middle treatment group is unknown. This middle concentration during the second dosing was the high concentration in the original dose concentrations which was measured and was 98.6% of nominal. The classification of this study is ***supplemental***.

NOAEC: 477 mg ai/kg diet (mean-measured)
LOAEC: >477 mg ai/kg diet (mean-measured)
Endpoint(s) Affected: None.

III. REFERENCES:

A reference list was not provided.

APPENDIX I. OUTPUT OF REVIEWER'S STATISTICAL VERIFICATION:

bobwhite repro, fluometuron, MRID 479844-01
PRINTOUT OF RAW DATA

Obs	TRT	EL	EC	ENC_EL	ES	ES_EL	VE	VE_ES	LE	LE_VE	NH	NH_EL	NH_ES
1	Ctrl	43	0	100.00	41	95.35	36	87.80	35	97.22	18	41.86	43.90
2	Ctrl	47	1	97.87	44	93.62	28	63.64	26	92.86	15	31.91	34.09
3	Ctrl	53	1	98.11	50	94.34	49	98.00	49	100.00	43	81.13	86.00
4	Ctrl	27	0	100.00	25	92.59	20	80.00	20	100.00	14	51.85	56.00
5	Ctrl	44	1	97.73	41	93.18	40	97.56	39	97.50	30	68.18	73.17
6	Ctrl	46	0	100.00	44	95.65	39	88.64	36	92.31	27	58.70	61.36
7	Ctrl	47	0	100.00	45	95.74	40	88.89	36	90.00	24	51.06	53.33
8	Ctrl	38	0	100.00	36	94.74	21	58.33	18	85.71	10	26.32	27.78
9	Ctrl	61	0	100.00	59	96.72	58	98.31	54	93.10	46	75.41	77.97
10	Ctrl	39	0	100.00	37	94.87	34	91.89	31	91.18	21	53.85	56.76
11	Ctrl	0	0	.	0	.	0	.	0	.	0	.	.
12	Ctrl	54	0	100.00	52	96.30	50	96.15	46	92.00	37	68.52	71.15
13	Ctrl	50	0	100.00	48	96.00	46	95.83	43	93.48	20	40.00	41.67
14	Ctrl	41	0	100.00	39	95.12	38	97.44	33	86.84	26	63.41	66.67
15	Ctrl	26	0	100.00	24	92.31	22	91.67	21	95.45	14	53.85	58.33
16	Ctrl	49	0	100.00	47	95.92	39	82.98	38	97.44	23	46.94	48.94
17	Dose1	40	1	97.50	37	92.50	31	83.78	29	93.55	21	52.50	56.76
18	Dose1	32	0	100.00	30	93.75	27	90.00	26	96.30	20	62.50	66.67
19	Dose1	30	1	96.67	27	90.00	25	92.59	20	80.00	13	43.33	48.15
20	Dose1	0	0	.	0	.	0	.	0	.	0	.	.
21	Dose1	54	0	100.00	52	96.30	49	94.23	48	97.96	41	75.93	78.85
22	Dose1	49	0	100.00	47	95.92	45	95.74	40	88.89	31	63.27	65.96
23	Dose1	0	0	.	0	.	0	.	0	.	0	.	.
24	Dose1	38	1	97.37	35	92.11	24	68.57	24	100.00	16	42.11	45.71
25	Dose1	53	0	100.00	51	96.23	45	88.24	41	91.11	26	49.06	50.98
26	Dose1	48	1	97.92	45	93.75	45	100.00	43	95.56	36	75.00	80.00
27	Dose1	40	1	97.50	37	92.50	32	86.49	29	90.63	25	62.50	67.57
28	Dose1	51	0	100.00	49	96.08	48	97.96	47	97.92	44	86.27	89.80
29	Dose1	42	0	100.00	40	95.24	21	52.50	21	100.00	14	33.33	35.00
30	Dose1	39	0	100.00	37	94.87	37	100.00	34	91.89	21	53.85	56.76
31	Dose1	36	0	100.00	34	94.44	26	76.47	25	96.15	16	44.44	47.06
32	Dose1	41	0	100.00	39	95.12	38	97.44	38	100.00	30	73.17	76.92
33	Dose2	34	0	100.00	32	94.12	20	62.50	20	100.00	18	52.94	56.25
34	Dose2	51	0	100.00	49	96.08	46	93.88	44	95.65	35	68.63	71.43
35	Dose2	30	0	100.00	28	93.33	0	0.00	0	.	0	0.00	0.00
36	Dose2	45	1	97.78	42	93.33	42	100.00	41	97.62	35	77.78	83.33
37	Dose2	30	0	100.00	28	93.33	24	85.71	24	100.00	15	50.00	53.57
38	Dose2	24	0	100.00	22	91.67	22	100.00	22	100.00	18	75.00	81.82
39	Dose2	25	0	100.00	23	92.00	22	95.65	22	100.00	16	64.00	69.57
40	Dose2	51	0	100.00	49	96.08	45	91.84	44	97.78	42	82.35	85.71
41	Dose2	18	0	100.00	16	88.89	14	87.50	12	85.71	9	50.00	56.25
42	Dose2	52	0	100.00	50	96.15	44	88.00	39	88.64	21	40.38	42.00
43	Dose2	52	0	100.00	50	96.15	46	92.00	42	91.30	41	78.85	82.00
44	Dose2	40	0	100.00	38	95.00	38	100.00	38	100.00	33	82.50	86.84
45	Dose2	0	0	.	0	.	0	.	0	.	0	.	.
46	Dose2	43	0	100.00	41	95.35	38	92.68	36	94.74	36	83.72	87.80
47	Dose2	42	0	100.00	40	95.24	37	92.50	35	94.59	25	59.52	62.50
48	Dose2	53	0	100.00	51	96.23	35	68.63	31	88.57	21	39.62	41.18
49	Dose3	38	0	100.00	36	94.74	35	97.22	35	100.00	25	65.79	69.44
50	Dose3	43	2	95.35	39	90.70	31	79.49	24	77.42	16	37.21	41.03

51	Dose3	46	0	100.00	44	95.65	41	93.18	40	97.56	30	65.22	68.18
52	Dose3	48	0	100.00	46	95.83	42	91.30	36	85.71	15	31.25	32.61
53	Dose3	27	0	100.00	25	92.59	19	76.00	19	100.00	8	29.63	32.00
54	Dose3	33	1	96.97	30	90.91	30	100.00	28	93.33	16	48.48	53.33
55	Dose3	41	1	97.56	38	92.68	19	50.00	18	94.74	10	24.39	26.32
56	Dose3	42	1	97.62	39	92.86	37	94.87	35	94.59	21	50.00	53.85
57	Dose3	51	0	100.00	49	96.08	45	91.84	41	91.11	26	50.98	53.06
58	Dose3	36	0	100.00	34	94.44	24	70.59	20	83.33	10	27.78	29.41
59	Dose3	37	0	100.00	35	94.59	34	97.14	32	94.12	17	45.95	48.57
60	Dose3	30	0	100.00	28	93.33	28	100.00	25	89.29	20	66.67	71.43
61	Dose3	53	0	100.00	51	96.23	49	96.08	44	89.80	40	75.47	78.43
62	Dose3	24	0	100.00	22	91.67	21	95.45	20	95.24	16	66.67	72.73
63	Dose3	37	0	100.00	35	94.59	34	97.14	31	91.18	24	64.86	68.57
64	Dose3	44	0	100.00	42	95.45	41	97.62	35	85.37	32	72.73	76.19

bobwhite repro, fluometuron, MRID 479844-01
PRINTOUT OF RAW DATA (continued)

Obs	TRT	NH_LE	HS	HS_ES	HS_NH	THICK	HATWT	SURVWT	FOOD	WTGAINM	WTGAINF
1	Ctrl	51.43	12	29.27	66.67	0.22	.	30	14	-9	5
2	Ctrl	57.69	12	27.27	80.00	0.23	.	31	16	-2	30
3	Ctrl	87.76	36	72.00	83.72	0.21	.	32	15	10	28
4	Ctrl	70.00	14	56.00	100.00	0.22	.	31	13	-1	26
5	Ctrl	76.92	27	65.85	90.00	0.22	.	32	14	-13	28
6	Ctrl	75.00	19	43.18	70.37	0.23	.	30	14	19	7
7	Ctrl	66.67	24	53.33	100.00	0.20	.	33	15	7	8
8	Ctrl	55.56	7	19.44	70.00	0.21	.	35	13	-4	20
9	Ctrl	85.19	35	59.32	76.09	0.21	.	31	17	45	50
10	Ctrl	67.74	17	45.95	80.95	0.22	.	28	16	-1	13
11	Ctrl	.	0	.	.	.	.	.	13	0	-2
12	Ctrl	80.43	33	63.46	89.19	0.23	.	29	14	3	20
13	Ctrl	46.51	10	20.83	50.00	0.22	.	32	15	3	47
14	Ctrl	78.79	10	25.64	38.46	0.23	.	32	15	27	41
15	Ctrl	66.67	13	54.17	92.86	0.19	.	32	15	7	29
16	Ctrl	60.53	18	38.30	78.26	0.24	.	31	14	-14	34
17	Dose1	72.41	18	48.65	85.71	0.24	.	31	15	-23	16
18	Dose1	76.92	17	56.67	85.00	0.22	.	30	14	9	31
19	Dose1	65.00	7	25.93	53.85	0.21	.	30	14	9	19
20	Dose1	.	0	.	.	.	.	.	13	-3	-40
21	Dose1	85.42	31	59.62	75.61	0.21	.	30	16	-13	29
22	Dose1	77.50	29	61.70	93.55	0.19	.	31	13	-3	38
23	Dose1	.	0	.	.	.	.	.	14	12	24
24	Dose1	66.67	15	42.86	93.75	0.22	.	32	16	38	19
25	Dose1	63.41	23	45.10	88.46	0.23	.	32	16	35	28
26	Dose1	83.72	32	71.11	88.89	0.24	.	32	16	26	30
27	Dose1	86.21	25	67.57	100.00	0.22	.	30	15	-1	31
28	Dose1	93.62	31	63.27	70.45	0.22	.	32	14	13	56
29	Dose1	66.67	10	25.00	71.43	0.23	.	32	14	1	58
30	Dose1	61.76	17	45.95	80.95	0.21	.	34	15	5	29
31	Dose1	64.00	10	29.41	62.50	0.22	.	29	14	-6	39
32	Dose1	78.95	21	53.85	70.00	0.21	.	31	16	-9	23
33	Dose2	90.00	16	50.00	88.89	0.21	.	33	15	5	-9
34	Dose2	79.55	32	65.31	91.43	0.24	.	32	21	6	56
35	Dose2	.	0	0.00	.	0.22	.	.	14	6	30
36	Dose2	85.37	29	69.05	82.86	0.23	.	31	16	13	33
37	Dose2	62.50	14	50.00	93.33	0.22	.	34	15	23	22

38	Dose2	81.82	15	68.18	83.33	0.22	.	32	16	17	33
39	Dose2	72.73	15	65.22	93.75	0.23	.	33	16	3	33
40	Dose2	95.45	19	38.78	45.24	0.23	.	32	15	37	35
41	Dose2	75.00	7	43.75	77.78	0.20	.	33	13	18	12
42	Dose2	53.85	17	34.00	80.95	0.22	.	29	15	-4	12
43	Dose2	97.62	30	60.00	73.17	0.19	.	32	15	16	22
44	Dose2	86.84	26	68.42	78.79	0.23	.	31	13	-5	22
45	Dose2	.	0	.	.	.	.	.	13	-11	-27
46	Dose2	100.00	17	41.46	47.22	0.22	.	34	17	-1	44
47	Dose2	71.43	18	45.00	72.00	0.24	.	31	15	6	31
48	Dose2	67.74	20	39.22	95.24	0.21	.	31	17	-9	24
49	Dose3	71.43	19	52.78	76.00	0.21	.	33	14	9	19
50	Dose3	66.67	12	30.77	75.00	0.21	.	31	15	23	-55
51	Dose3	75.00	23	52.27	76.67	0.22	.	33	14	13	8
52	Dose3	41.67	10	21.74	66.67	0.22	.	35	14	20	56
53	Dose3	42.11	8	32.00	100.00	0.23	.	32	14	-1	-7
54	Dose3	57.14	13	43.33	81.25	0.22	.	31	13	2	17
55	Dose3	55.56	7	18.42	70.00	0.24	.	33	15	51	47
56	Dose3	60.00	17	43.59	80.95	0.22	.	31	14	-8	10
57	Dose3	63.41	22	44.90	84.62	0.23	.	32	15	-5	7
58	Dose3	50.00	6	17.65	60.00	0.23	.	32	15	35	53
59	Dose3	53.13	10	28.57	58.82	0.20	.	31	15	3	26
60	Dose3	80.00	18	64.29	90.00	0.20	.	30	15	17	31
61	Dose3	90.91	34	66.67	85.00	0.21	.	31	17	26	43
62	Dose3	80.00	14	63.64	87.50	0.22	.	29	15	13	22
63	Dose3	77.42	19	54.29	79.17	0.21	.	29	14	-2	39
64	Dose3	91.43	19	45.24	59.38	0.23	.	30	15	23	-17

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE EL (Eggs Laid)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.886	<.001	1.104	0.355	USE NON-PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	16	41.56	14.32	3.58	34.47	33.93,	49.20
Dose1	16	37.06	16.09	4.02	43.41	28.49,	45.64
Dose2	16	36.88	15.01	3.75	40.72	28.87,	44.88
Dose3	16	39.38	8.27	2.07	21.00	34.97,	43.78

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	45.00	0.00	61.00	.	.
Dose1	40.00	0.00	54.00	89.17	10.83
Dose2	41.00	0.00	53.00	88.72	11.28
Dose3	39.50	24.00	53.00	94.74	5.26

****

```
NON-PARAMETRIC ANALYSES     - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
           3                 1.73       0.630

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

 Level      Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl       45.00                    .                        .
  Dose1      40.00                  0.544                    0.173
  Dose2      41.00                  0.559                    0.165
  Dose3      39.50                  0.314                    0.145

 SUMMARY                       NOEC            LOEC
   MannWhit (Bonf adjust)      Dose3           >highest dose
   Jonckheere                  Dose3           >highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE NEG_EC  ( Eggs Cracked )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.697         <.001          5.899      0.001    USE NON-PARAMETRIC TESTS

*******************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean    StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  16     0.19     0.40        0.10      214.99          0.00,     0.40
  Dose1 16     0.31     0.48        0.12      153.19          0.06,     0.57
  Dose2 16     0.06     0.25        0.06      400.00          0.00,     0.20
  Dose3 16     0.31     0.60        0.15      192.67          0.00,     0.63

 Level       Median     Min       Max    %of Control(means)   %Reduction(means)
  Ctrl         0.00     0.00      1.00          .                    .
  Dose1        0.00     0.00      1.00        166.67               -66.67
  Dose2        0.00     0.00      1.00         33.33                66.67
  Dose3        0.00     0.00      2.00        166.67               -66.67

*******************************************************************************
NON-PARAMETRIC ANALYSES     - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
           3                 3.34       0.343

MannWhit(Bon) - testing each trt median signif. greater than control
Jonckheere - test assumes dose-response relationship, testing positive trend

 Level      Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl       0.00                     .                        .
```

Dose1	0.00	1.000	0.211
Dose2	0.00	1.000	0.815
Dose3	0.00	1.000	0.524

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE ENC_EL ((EL-EC)/EL (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.760	<.001	7.913	<.001	USE NON-PARAMETRIC TESTS

****
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	15	99.58	0.87	0.22	0.87	99.10, 100.00
Dose1	14	99.07	1.32	0.35	1.33	98.30, 99.83
Dose2	15	99.85	0.57	0.15	0.57	99.53, 100.00
Dose3	16	99.22	1.48	0.37	1.49	98.43, 100.00

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	100.00	97.73	100.00	.	.
Dose1	100.00	96.67	100.00	99.48	0.52
Dose2	100.00	97.78	100.00	100.27	-0.27
Dose3	100.00	95.35	100.00	99.64	0.36

****
NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	4.40	0.221

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	100.00	.	.
Dose1	100.00	1.000	0.111
Dose2	100.00	1.000	0.773
Dose3	100.00	1.000	0.496

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE ES (Eggs Set)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.902	<.001	1.148	0.337	USE NON-PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	16	39.50	13.86	3.46	35.08	32.12,	46.88
Dose1	16	35.00	15.44	3.86	44.13	26.77,	43.23
Dose2	16	34.94	14.66	3.66	41.96	27.13,	42.75
Dose3	16	37.06	8.25	2.06	22.26	32.67,	41.46

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	42.50	0.00	59.00	.	.
Dose1	37.00	0.00	52.00	88.61	11.39
Dose2	39.00	0.00	51.00	88.45	11.55
Dose3	37.00	22.00	51.00	93.83	6.17

****

NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	1.74	0.628

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	42.50	.	.
Dose1	37.00	0.501	0.159
Dose2	39.00	0.619	0.177
Dose3	37.00	0.304	0.143

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE ES_EL (EggsSet/EggsLaid (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.929	0.002	1.077	0.366	USE NON-PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	15	94.83	1.36	0.35	1.44	94.08,	95.58
Dose1	14	94.20	1.87	0.50	1.99	93.12,	95.28
Dose2	15	94.20	2.13	0.55	2.26	93.02,	95.38
Dose3	16	93.90	1.83	0.46	1.95	92.92,	94.87

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	95.12	92.31	96.72	.	.
Dose1	94.66	90.00	96.30	99.34	0.66
Dose2	95.00	88.89	96.23	99.33	0.67
Dose3	94.52	90.70	96.23	99.02	0.98

****

NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	1.83	0.609

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	95.12	.	.
Dose1	94.66	0.716	0.229
Dose2	95.00	0.999	0.288
Dose3	94.52	0.265	0.111

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE VE (Viable Embryo(d14))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.944	0.006	1.452	0.237	USE NON-PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	16	35.00	14.21	3.55	40.59	27.43,	42.57
Dose1	16	30.81	15.13	3.78	49.11	22.75,	38.88
Dose2	16	29.56	15.48	3.87	52.37	21.31,	37.81
Dose3	16	33.13	9.26	2.31	27.95	28.19,	38.06

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	38.50	0.00	58.00	.	.
Dose1	31.50	0.00	49.00	88.04	11.96

Dose2	36.00	0.00	46.00	84.46	15.54
Dose3	34.00	19.00	49.00	94.64	5.36

****

NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	1.10	0.777

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	38.50	.	.
Dose1	31.50	0.651	0.209
Dose2	36.00	0.558	0.142
Dose3	34.00	0.718	0.192

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE VE_ES (ViableEmbryo/EggsSet (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.723	<.001	1.011	0.395	USE NON-PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval	
Ctrl	15	87.81	12.27	3.17	13.97	81.02,	94.60
Dose1	14	87.43	13.55	3.62	15.50	79.61,	95.25
Dose2	15	83.39	25.43	6.57	30.50	69.31,	97.48
Dose3	16	89.25	13.64	3.41	15.29	81.98,	96.52

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	91.67	58.33	98.31	.	.
Dose1	91.30	52.50	100.00	99.57	0.43
Dose2	92.00	0.00	100.00	94.97	5.03
Dose3	95.16	50.00	100.00	101.64	-1.64

****

NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	0.65	0.884

MannWhit(Bon) - testing each trt median signif. less than control

```
Jonckheere - test assumes dose-response relationship, testing negative trend

 Level     Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl      91.67                     .                       .
  Dose1     91.30                 1.000                   0.509
  Dose2     92.00                 1.000                   0.491
  Dose3     95.16                 1.000                   0.731

 SUMMARY                       NOEC            LOEC
   MannWhit (Bonf adjust)      Dose3           >highest dose
   Jonckheere                  Dose3           >highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE LE  ( Live Embryo(d21) )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.949         0.010          1.260      0.296    USE NON-PARAMETRIC TESTS

*****************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean     StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  16    32.81     13.49        3.37       41.10          25.63,   40.00
  Dose1 16    29.06     14.44        3.61       49.70          21.37,   36.76
  Dose2 16    28.13     14.60        3.65       51.90          20.35,   35.90
  Dose3 16    30.19      8.42        2.10       27.88          25.70,   34.67

 Level       Median      Min       Max    %of Control(means)   %Reduction(means)
  Ctrl        35.50      0.00      54.00          .                    .
  Dose1       29.00      0.00      48.00        88.57                11.43
  Dose2       33.00      0.00      44.00        85.71                14.29
  Dose3       31.50     18.00      44.00        92.00                 8.00

*****************************************************************************
NON-PARAMETRIC ANALYSES     - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
           3                 0.97       0.808

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

 Level     Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl      35.50                     .                       .
  Dose1     29.00                 0.826                   0.267
  Dose2     33.00                 0.789                   0.230
  Dose3     31.50                 0.501                   0.181

 SUMMARY                       NOEC            LOEC
   MannWhit (Bonf adjust)      Dose3           >highest dose
```

Jonckheere	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE LE_VE (LiveEmbryo/ViableEmbryo (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.952	0.021	0.509	0.677	USE PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval	
Ctrl	15	93.67	4.31	1.11	4.60	91.29,	96.06
Dose1	14	94.28	5.52	1.48	5.86	91.09,	97.47
Dose2	14	95.33	4.96	1.33	5.21	92.46,	98.20
Dose3	16	91.42	6.16	1.54	6.74	88.14,	94.71

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	93.10	85.71	100.00	.	.
Dose1	95.85	80.00	100.00	100.65	-0.65
Dose2	96.64	85.71	100.00	101.77	-1.77
Dose3	92.25	77.42	100.00	97.60	2.40

****

PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	55	1.47	0.232

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	93.67	.	94.41	.	0.990	0.835	0.642	.	.
Dose1	94.28	0.849	94.41	0.733	.	0.953	0.461	.	.
Dose2	95.33	0.949	94.41	0.767	.	.	0.196	.	.
Dose3	91.42	0.258	91.42	0.159	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE NH (Number Hatched)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01

Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.972	0.155	0.940	0.427	USE PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	16	23.00	12.01	3.00	52.20	16.60,	29.40
Dose1	16	22.13	12.65	3.16	57.19	15.38,	28.87
Dose2	16	22.81	13.34	3.34	58.49	15.70,	29.92
Dose3	16	20.38	8.74	2.18	42.89	15.72,	25.03

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	22.00	0.00	46.00	.	.
Dose1	21.00	0.00	44.00	96.20	3.80
Dose2	21.00	0.00	42.00	99.18	0.82
Dose3	18.50	8.00	40.00	88.59	11.41

****

PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	60	0.16	0.920

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	23.00	.	23.00	.	0.997	1.000	0.923	.	.
Dose1	22.13	0.669	22.47	0.528	.	0.998	0.975	.	.
Dose2	22.81	0.733	22.47	0.561	.	.	0.937	.	.
Dose3	20.38	0.485	20.38	0.352	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE NH_EL (NumberHatched/EggsLaid (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.951	0.017	0.804	0.497	USE PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	15	54.20	15.53	4.01	28.66	45.60,	62.80
Dose1	14	58.38	15.43	4.12	26.43	49.47,	67.28
Dose2	15	60.35	22.68	5.86	37.58	47.79,	72.91
Dose3	16	51.44	17.30	4.32	33.63	42.22,	60.66

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	53.85	26.32	81.13	.	.
Dose1	58.17	33.33	86.27	107.70	-7.70
Dose2	64.00	0.00	83.72	111.35	-11.35
Dose3	50.49	24.39	75.47	94.91	5.09

****

PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	56	0.76	0.519

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	54.20	.	57.63	.	0.924	0.786	0.974	.	.
Dose1	58.38	0.917	57.63	0.780	.	0.991	0.720	.	.
Dose2	60.35	0.959	57.63	0.815	.	.	0.519	.	.
Dose3	51.44	0.576	51.44	0.442	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE NH_ES (NumberHatched/EggsSet (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.947	0.011	0.825	0.486	USE PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	15	57.14	16.30	4.21	28.53	48.11,	66.17
Dose1	14	61.87	15.83	4.23	25.58	52.73,	71.01
Dose2	15	64.02	23.89	6.17	37.33	50.78,	77.25
Dose3	16	54.70	18.07	4.52	33.04	45.07,	64.33

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	56.76	27.78	86.00	.	.
Dose1	61.36	35.00	89.80	108.27	-8.27
Dose2	69.57	0.00	87.80	112.03	-12.03
Dose3	53.59	26.32	78.43	95.72	4.28

****

PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests

Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	56	0.78	0.508

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	57.14	.	60.99	.	0.906	0.750	0.984	.	.
Dose1	61.87	0.926	60.99	0.792	.	0.990	0.727	.	.
Dose2	64.02	0.965	60.99	0.827	.	.	0.519	.	.
Dose3	54.70	0.604	54.70	0.471	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE NH_LE (NumberHatched/LiveEmbryo (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.981	0.471	1.092	0.360	USE PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	15	68.46	12.37	3.19	18.07	61.61, 75.31
Dose1	14	74.45	10.21	2.73	13.71	68.55, 80.34
Dose2	14	79.99	13.64	3.65	17.06	72.11, 87.87
Dose3	16	65.99	15.74	3.93	23.85	57.61, 74.38

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	67.74	46.51	87.76	.	.
Dose1	74.67	61.76	93.62	108.75	-8.75
Dose2	80.68	53.85	100.00	116.85	-16.85
Dose3	65.04	41.67	91.43	96.40	3.60

****

PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	55	3.32	0.026

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	68.46	.	74.16	.	0.618	0.100	0.954	.	.
Dose1	74.45	0.981	74.16	0.931	.	0.686	0.310	.	.
Dose2	79.99	1.000	74.16	0.948	.	.	0.027	.	.
Dose3	65.99	0.536	65.99	0.400	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE HS (Hatching Survival(d14))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.975	0.213	0.843	0.476	USE PARAMETRIC TESTS

****
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	16	17.94	10.47	2.62	58.34	12.36, 23.51
Dose1	16	17.88	10.47	2.62	58.60	12.29, 23.46
Dose2	16	17.19	9.41	2.35	54.75	12.17, 22.20
Dose3	16	15.69	7.24	1.81	46.13	11.83, 19.54

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	15.50	0.00	36.00	.	.
Dose1	17.50	0.00	32.00	99.65	0.35
Dose2	17.00	0.00	32.00	95.82	4.18
Dose3	15.50	6.00	34.00	87.46	12.54

****
PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	60	0.19	0.900

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend

Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	17.94	.	17.94	.	1.000	0.996	0.908	.	.
Dose1	17.88	0.743	17.88	0.575	.	0.997	0.914	.	.
Dose2	17.19	0.663	17.19	0.518	.	.	0.970	.	.
Dose3	15.69	0.466	15.69	0.334	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE HS_ES (HatchingSurvival/EggsSet (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.960	0.046	0.185	0.906	USE PARAMETRIC TESTS

****
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	15	44.93	17.33	4.48	38.58	35.34, 54.53
Dose1	14	49.76	15.04	4.02	30.22	41.08, 58.44
Dose2	15	49.23	18.37	4.74	37.32	39.05, 59.40
Dose3	16	42.51	16.19	4.05	38.08	33.88, 51.13

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	45.95	19.44	72.00	.	.
Dose1	51.25	25.00	71.11	110.74	-10.74
Dose2	50.00	0.00	69.05	109.55	-9.55
Dose3	44.24	17.65	66.67	94.60	5.40

****
PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	56	0.65	0.585

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	44.93	.	47.93	.	0.866	0.897	0.978	.	.
Dose1	49.76	0.940	47.93	0.770	.	1.000	0.642	.	.

```
 Dose2   49.23   0.930     47.93     0.805     .       .       0.683    .       .
 Dose3   42.51   0.586     42.51     0.453     .       .       .        .       .

 SUMMARY                    NOEC           LOEC
   Dunnett                   Dose3          >highest dose
   Williams                  Dose3          >highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE HS_NH  ( HatchingSurvival/NumberHatched (%) )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.953         0.023          0.410      0.746    USE PARAMETRIC TESTS

*****************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean     StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  15    77.77     17.12       4.42       22.02          68.29,   87.25
  Dose1 14    80.01     13.17       3.52       16.46          72.41,   87.62
  Dose2 14    78.86     15.71       4.20       19.93          69.78,   87.93
  Dose3 16    76.94     11.72       2.93       15.23          70.69,   83.18

 Level       Median      Min       Max    %of Control(means)   %Reduction(means)
  Ctrl        80.00     38.46     100.00          .                  .
  Dose1       82.98     53.85     100.00       102.88              -2.88
  Dose2       81.90     45.24      95.24       101.39              -1.39
  Dose3       77.92     58.82     100.00        98.93               1.07

*****************************************************************************
PARAMETRIC ANALYSES     - use alpha-level=0.05 for all tests
    Analysis of Variance (ANOVA) - overall F-test
     Numerator df    Denominator df    F-stat       P-value
           3              55              0.12        0.945

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level    Mean   Dunnett  Isotonic  Williams                  Tukey p-values
                p-value    mean     p-value   Dose1   Dose2   Dose3   Dose4   Dose5

 Ctrl    77.77     .       78.85       .       0.976   0.997   0.999    .       .
 Dose1   80.01   0.876     78.85     0.667      .      0.997   0.938    .       .
 Dose2   78.86   0.818     78.85     0.702      .       .      0.984    .       .
 Dose3   76.94   0.691     76.94     0.565      .       .       .       .       .

 SUMMARY                    NOEC           LOEC
   Dunnett                   Dose3          >highest dose
   Williams                  Dose3          >highest dose
```

Bobwhite repro, Fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE THICK (Eggshell thickness)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.948	0.013	0.047	0.986	USE PARAMETRIC TESTS

****
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval	
Ctrl	15	0.22	0.01	0.00	5.95	0.21,	0.23
Dose1	14	0.22	0.01	0.00	6.06	0.21,	0.23
Dose2	15	0.22	0.01	0.00	6.29	0.21,	0.23
Dose3	16	0.22	0.01	0.00	5.25	0.21,	0.22

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	0.22	0.19	0.24	.	.
Dose1	0.22	0.19	0.24	100.28	-0.28
Dose2	0.22	0.19	0.24	100.91	-0.91
Dose3	0.22	0.20	0.24	100.04	-0.04

****
PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	56	0.08	0.972

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	0.22	.	0.22	.	0.999	0.974	1.000	.	.
Dose1	0.22	0.794	0.22	0.660	.	0.992	0.999	.	.
Dose2	0.22	0.877	0.22	0.696	.	.	0.976	.	.
Dose3	0.22	0.757	0.22	0.644	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE HATWT (Hatchling Weight)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.535	<.001	2.052	0.116	USE NON-PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf. Interval
Ctrl	0	.	.	.	.	. , .
Dose1	0	.	.	.	.	. , .
Dose2	0	.	.	.	.	. , .
Dose3	0	.	.	.	.	. , .

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	.	.	.	.	.
Dose1	.	.	.	.	.
Dose2	.	.	.	.	.
Dose3	.	.	.	.	.

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	.	.	.
Dose1	.	.	.
Dose2	.	.	.
Dose3	.	.	.

MannWhit (Bonf adjust)	<lowest dose	Dose1
Jonckheere	<lowest dose	Dose1

Bobwhite repro, Fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE SURVWT (Survivor Wt (d14))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.988	0.819	0.244	0.865	USE PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf. Interval
Ctrl	15	31.40	1.73	0.45	5.49	30.45, 32.36
Dose1	14	31.22	1.37	0.37	4.39	30.43, 32.01
Dose2	14	32.10	1.30	0.35	4.05	31.35, 32.85
Dose3	16	31.44	1.64	0.41	5.21	30.57, 32.31

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	31.46	27.71	35.26	.	.
Dose1	31.35	29.39	34.36	99.42	0.58
Dose2	31.87	29.49	34.28	102.22	-2.22
Dose3	31.08	28.55	35.00	100.12	-0.12

```
**************************************************************************
PARAMETRIC ANALYSES     - use alpha-level=0.05 for all tests
    Analysis of Variance (ANOVA) - overall F-test
     Numerator df    Denominator df    F-stat       P-value
            3            55              0.90        0.449

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level     Mean   Dunnett  Isotonic  Williams                  Tukey p-values
                 p-value    mean     p-value   Dose1   Dose2   Dose3   Dose4   Dose5

 Ctrl     31.40     .       31.57       .       0.988   0.611   1.000     .       .
 Dose1    31.22   0.623     31.57     0.704       .     0.430   0.979     .       .
 Dose2    32.10   0.981     31.57     0.738       .       .     0.642     .       .
 Dose3    31.44   0.776     31.44     0.666       .       .       .       .       .

 SUMMARY                    NOEC            LOEC
   Dunnett                   Dose3           >highest dose
   Williams                  Dose3           >highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE FOOD  ( Food Consumption )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.907         <.001          1.731      0.170    USE NON-PARAMETRIC TESTS

**************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean     StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  16    14.56     1.15        0.29        7.92          13.95,   15.18
  Dose1 16    14.69     1.08        0.27        7.34          14.11,   15.26
  Dose2 16    15.38     1.96        0.49       12.76          14.33,   16.42
  Dose3 16    14.63     0.89        0.22        6.05          14.15,   15.10

 Level       Median     Min       Max    %of Control(means)   %Reduction(means)
  Ctrl        14.50    13.00     17.00          .                   .
  Dose1       14.50    13.00     16.00       100.86               -0.86
  Dose2       15.00    13.00     21.00       105.58               -5.58
  Dose3       15.00    13.00     17.00       100.43               -0.43

**************************************************************************
NON-PARAMETRIC ANALYSES     - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
            3               2.48       0.479
```

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	14.50	.	.
Dose1	14.50	1.000	0.645
Dose2	15.00	1.000	0.910
Dose3	15.00	1.000	0.666

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE WTGAINM (Male wt gain)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.956	0.022	0.347	0.791	USE PARAMETRIC TESTS

****
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	16	4.81	15.12	3.78	314.15	-3.24, 12.87
Dose1	16	5.63	16.68	4.17	296.55	-3.26, 14.51
Dose2	16	7.50	12.71	3.18	169.43	0.73, 14.27
Dose3	16	13.69	15.87	3.97	115.94	5.23, 22.14

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	1.50	-14.00	45.00	.	.
Dose1	3.00	-23.00	38.00	116.88	-16.88
Dose2	6.00	-11.00	37.00	155.84	-55.84
Dose3	13.00	-8.00	51.00	284.42	-184.42

****
PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	60	1.12	0.348

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	4.81	.	7.91	.	0.999	0.958	0.356	.	.
Dose1	5.63	0.802	7.91	0.801	.	0.985	0.442	.	.
Dose2	7.50	0.894	7.91	0.832	.	.	0.658	.	.

```
 Dose3   13.69   0.995      7.91     0.848      .        .        .        .        .

 SUMMARY                     NOEC           LOEC
   Dunnett                    Dose3          >highest dose
   Williams                   Dose3          >highest dose

bobwhite repro, fluometuron, MRID 479844-01
ANALYSIS RESULTS FOR VARIABLE WTGAINF  ( Female wt gain )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.917         <.001          1.222      0.310    USE NON-PARAMETRIC TESTS

*******************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean     StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  16    24.00     15.11       3.78       62.97          15.95,   32.05
  Dose1 16    26.88     21.42       5.35       79.69          15.46,   38.29
  Dose2 16    23.31     19.76       4.94       84.75          12.78,   33.84
  Dose3 16    18.69     28.62       7.15      153.13           3.44,   33.94

 Level       Median      Min       Max    %of Control(means)   %Reduction(means)
  Ctrl        27.00    -2.00      50.00          .                    .
  Dose1       29.00   -40.00      58.00       111.98                -11.98
  Dose2       27.00   -27.00      56.00        97.14                  2.86
  Dose3       20.50   -55.00      56.00        77.86                 22.14

*******************************************************************************
NON-PARAMETRIC ANALYSES     - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
           3                1.29       0.732

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

 Level     Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl      27.00                  .                        .
  Dose1     29.00                1.000                    0.822
  Dose2     27.00                1.000                    0.685
  Dose3     20.50                1.000                    0.387

 SUMMARY                     NOEC           LOEC
   MannWhit (Bonf adjust)     Dose3          >highest dose
   Jonckheere                 Dose3          >highest dose
```